October 30, 2000

Mr. James Chang (SFD-8-1)
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: **Contract No. 68-W-98-0220 / WA No. 220-11-09WQ George/Norton Air Force Base Work Assignment, Review of the Draft Water Quality Protection Standards for Operable Unit 3 Rehabilitated Landfill Sites (DP-03, DP-04, LF-12, LF-14, and the Southeast Disposal Area), October 2000**

Dear Mr. Chang,

Enclosed please find TechLaw's Review of the Draft Water Quality Protection Standards for Operable Unit 3 Rehabilitated Landfill Sites (DP-03, DP-04, LF-12, LF-14, and the Southeast Disposal Area) dated October 2000 (the Report). The Report was reviewed by Mr. Jim Cureton and the QC review was conducted by Ms. Indira Balkissoon.

This review is being forwarded to you through electronic mail (via Internet) in WordPerfect® Version 8.0. A hard copy of the evaluation will also be submitted with this cover letter.

Thank you for the opportunity to provide U. S. EPA with technical services at George Air Force Base. TechLaw looks forward to working with you in the future. Should you have any questions, please call me at (415) 281-8730, ext.14.

Sincerely,

Indira Balkissoon
Site Manager

copy to: Angela Commisso, Region 9 w/o attachment
Joe Eidelberg, U.S. EPA
P. Brown-Derocher, Central Files

GEORGE AIR FORCE BASE
Victorville, California

Review of the Draft Water Quality Protection Standards for Operable Unit 3 Rehabilitated Landfill Sites (DP-03, DP-04, LF-12, LF-14, and the Southeast Disposal Area)

October 2000

Submitted to:

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220-11-09WQ

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October 30, 2000

Review of the Draft Water Quality Protection Standards for Operable Unit 3 Rehabilitated Landfill Sites (DP-03, DP-04, LF-12, LF-14, and the Southeast Disposal Area) October 2000

General Comments:

1. The Draft Water Quality Protection Standards (WQPS) for Operable Unit 3 Rehabilitated Landfill Sites (DP-03, DP-04, LF-12, LF-14, and the Southeast Disposal Area), (the Report) does not reference the regulations that are being used to develop the WQPS. The implementation of post closure groundwater monitoring requirements, such as the development of WQPS, is required by the Code of Federal Regulations, Title 40, Part 258 (40 CFR 258) and the California Code of Regulations Title 27, Subchapter 3, Article 1 (27 CCR). In order to provide the context under which the WQPS are being developed, please revise the Report to include a reference to the regulations for post closure groundwater monitoring requirements.

2. It appears that the list of constituents of concern for groundwater monitoring at each of the landfills may not be complete. The Air Force proposes to monitor the groundwater at each of the landfills for metals surrogates (chloride, nitrate-nitrogen, TDS, and sulfate) only. It is not clear why contaminants detected at each of the landfills during the remedial investigation (RI) are not included in the COC list. Additional contaminants detected during the RI included:

   - Lead, SVOCs, and TPH at DP-03
   - Lead, nickel, mercury, zinc, TPH, and pesticides at DP-04
   - Chrysene, pyrene, TPH, VOCs, and pesticides at LF-14
   - VOCs, TPH, and pesticides at the Southeast Disposal Area (SEDA)

   §66264.93 of 27 CCR indicates that "constituents of concern are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the regulated unit." Please revise the Report to include the above contaminants as COC or to provide the rationale for why the contaminants were not selected as COC.

3. The locations of the proposed new background monitoring wells for landfills DP-03, DP-04, LF-12, and LF-14 are not presented in the Report. The Report recommends that new background monitoring wells for LF-12 and LF-14 be installed. The Report also recommends that a new monitoring well that is to be installed as part of the data gaps

investigation should be used as the background well for DP-03 and DP-04. U.S. EPA agrees that new background wells should be installed for these sites, however, the Air Force should conduct a careful analysis of groundwater flow direction at each landfill before selecting new background well locations. Please revise the Report to include a detailed groundwater flow analysis at each landfill site, and include the proposed locations of new background monitoring wells.

4. The Report does not contain information regarding the construction of the wells selected for monitoring of the OU-3 landfill sites. Lithologic logs, well construction diagrams, elevations of screened intervals, and recent groundwater elevations are necessary to determine whether the monitoring wells are screened across similar zones. The information is also necessary to evaluate the depth to groundwater at each monitoring well to ensure that the wells are screened in the upper most aquifer beneath each landfill site. Therefore, please revise the Report to include lithologic logs, well construction diagrams, and a table of screened interval elevations and recent groundwater elevations.

Specific Comments:

1. **Section 2.1, Hydrogeology of GAFB, page 2-1.** The Air Force states that the hydrogeologic units underlying George Air Force Base (GAFB) are thought to be undeformed. It is inappropriate to include this statement in the Report. Evidence presented by Rufus Catchings and Brett Cox of the U.S.G.S. at the January 31, 2000 meeting at U.S.G.S. offices in Menlo Park indicates that there is substantial faulting at GAFB. Both surface mapping and seismic imaging techniques have indicated that faulting is present at GAFB. The Report should not indicate that the hydrogeologic units are thought to be undeformed when evidence collected by the U.S.G.S. indicates that faulting is likely to be present. Please revise the Report to correct the statement that the hydrogeologic units are thought to be undeformed.

2. **Figure 2-1, OU-3 Landfill Monitoring Well Locations.** The groundwater flow directions presented on Figure 2-1 are not in agreement with the groundwater elevation contours presented on Figures 2-2 and 2-3. For instance, the groundwater flow direction at LF-12 depicted on Figure 2-1 is to the northeast. However, the groundwater elevation contours on Figure 2-2 indicate that the flow direction at LF-12 is to the southeast. Also, the groundwater flow direction at LF-14 depicted on Figure 2-1 is to the east and northeast, but the groundwater elevation contours on Figure 2-2 indicate that the flow direction at LF-12 is to the north. For consistency, please revise Figure 2-1 to include the appropriate groundwater flow contours. In areas where the groundwater flow direction is uncertain groundwater flow contours should be dashed.

3. **Figures 2-2 and 2-3, Surface of the Upper and Lower Aquifer, April 2000.** The usefulness of Figures 2-2 and 2-3 is diminished because they don't show locations of the landfills. Therefore, it is not possible to determine the closest monitoring wells to each landfill, the direction of groundwater gradients in the vicinity of each landfill, and the location of the upper and lower aquifers in relation to each landfill. It is also not possible to determine whether the monitoring well networks proposed for each landfill is appropriate. Please revise Figures 2-2 and 2-3 to include the locations of each landfill.

4. **Figures 2-2 and 2-3, Surface of the Upper and Lower Aquifer, April 2000.** It is difficult to determine whether the monitoring wells on Figures 2-2 and 2-3 are screened in the upper or lower aquifers. Figures 2-2 and 2-3 depict upper and lower aquifer monitoring wells with the same symbols. For clarity, please revise the figures to use a different symbol for upper and lower aquifer monitoring wells.

5. **Section 2.3, Monitoring Well Selection, page 2-3.** It is not clear that the monitoring wells selected to monitor landfill LF-12 are appropriately located. The groundwater flow direction in the vicinity of LF-12 is uncertain due to the lack of monitoring wells in the area. Since the three closest monitoring wells to LF-12 are located along an almost straight line, it is not possible to conclusively determine the groundwater flow direction at LF-12. If the groundwater gradient is to the east or southeast then it may not be appropriate to use NZ-60 as a compliance well and a new well located to the southeast may be more appropriate. In addition, at least one additional monitoring well located to the east of LF-12 is required to determine the groundwater flow direction at LF-12. Please revise Section 2.3 to indicate that the location of compliance monitoring wells at LF-12 requires additional information regarding the direction of groundwater flow beneath the landfill. If the groundwater flow direction is determined to be to the east or southeast then an additional compliance monitoring well should be installed at LF-12.

6. **Section 2.3, Monitoring Well Selection, page 2-3.** The location of monitoring well NZ-74 is not appropriate as a compliance well for landfills DP-03 and DP-04. NZ-74 is 1500 feet away from the landfills and based on the groundwater elevation contours presented on Figure 2-2, may not be located directly downgradient of the landfills. In order to effectively monitor the compliance points at DP-03 and DP-04, two new monitoring wells should be installed immediately downgradient of each landfill.

7. **Figure 2-3, Surface of the Upper Aquifer, April 2000.** Figure 2-3 does not contain a complete set of groundwater elevation measurements for the SEDA area. No groundwater elevation data are provided for at least six monitoring wells (SZ-07, SZ-08,

SZ-09, SZ-11, SZ-14, and RZ-01) in the vicinity of the SEDA do not have groundwater elevation data. In order to provide a complete picture of the groundwater flow direction in the vicinity of SEDA, please revise Figure 2-3 to include groundwater elevations from a sampling round that includes all of the monitoring wells near SEDA.

8. **Section 3.0, Development of Water Quality Protection Standards, page 3-1.** The data used to calculate the upper tolerance limits is not referenced in Section 3.0. In addition, the analytical results from quarterly sampling of the background wells, which were used to calculate the upper tolerance limits, are not presented in Section 3.0. Instead, the analytical results are presented in Appendix A, which is not referred to in Section 3.0. For clarity, please revise Section 3.0 to include a reference to Appendix A where the analytical results are presented.